

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-15 are pending in the present application. Claims 1, 5-9, and 13-15 are amended by the present amendment.

In the outstanding Office Action, the specification, title, and abstract were objected to; the drawings were objected to; the claims were objected to; Claims 1-15 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1, 2, 5-10, and 13-15 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 5,006,980 to Sanders; and Claims 3, 4, 11, and 12 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sanders in view of U.S. Patent No. 6,477,638 to Gearty and Hennessy.

The specification, title, and abstract are amended to overcome objections in light of comments in the outstanding Office Action. In particular, the title is amended to more clearly indicate the invention to which the claims are directed, the abstract is amended to be less than 150 words, and the specification is amended to correct minor informalities. Accordingly, applicant respectfully requests that those objections be withdrawn.

Regarding the objection to the drawings, Figures 1-4 are labeled "Prior Art" and reference designation 13 is added to Figure 15, as suggested in the outstanding Office Action. Accordingly, it is respectfully requested the objection to the drawings be withdrawn.

Regarding the objection to the claims, Claims 6-8, 14, and 15 are amended in light of comments in the outstanding Office Action. In addition, the type-setting of the claims is corrected to improve claim readability, as suggested in the outstanding Office Action. Accordingly, it is respectfully requested the objection to the claims be withdrawn.

Regarding the rejection of Claims 1-15 under 35 U.S.C. § 112, second paragraph, Claims 1, 5-7, 9, and 13-15 are amended to clearly recite the features of the claimed

invention, in light of comments in the outstanding Office Action. Accordingly, it is respectfully requested that rejection also be withdrawn.

Claims 1, 2, 5-10, and 13-15 were rejected under 35 U.S.C. § 102(e) as anticipated by Sanders. Applicant respectfully traverses that rejection.

Claim 1 is directed to a data processing apparatus that performs a pipeline processing by dividing a pipeline into a plurality of stages, and includes a first pipeline processing portion configured to perform the processing in a plurality of stages in sequence based on a plurality of control signals provided corresponding to the respective stages. The timings of the control signals are capable of being individually controlled. The apparatus also includes a first latch portion configured to latch the control signal inputted to each stage with a predetermined clock, and a second pipeline processing portion, disposed separately from the first pipeline processing portion, configured to perform the processing in each stage based on the control signal latched by the first latch portion. Independent Claim 9 includes similar features.

Thus, control signals are inputted to respective stages to control the pipeline in the claimed invention. By providing such control signals, the following two advantageous effects are obtained: 1) when there is a vacancy inside of the pipeline, it is possible to promptly fill the vacancy and speed up the pipeline processing, and 2) the control signals are separately inputted to the respective stages, and the timings of the control signals can be individually controlled, therefore, it is possible to sensitively control the operation of the pipelines in units of each stage.

Applicant respectfully submits that Sanders does not teach or suggest timings of control signals that are capable of being individually controlled. In Fig. 12, Sanders discloses an execution unit 21 having a pipeline structure, a memory management unit 30 having a pipeline structure, and a circuit for controlling these units.

In Sanders, the stages of the units are controlled based on the control input 28 or the latch signal of the control input 28. Because of this, the respective stages in the respective units operate in sync with the control input 28, and it is impossible to individually control operations or timings of the respective stages. Thus, Sanders does not teach or suggest “a plurality of control signals provided corresponding to the respective stages, said control signals having timings capable of being individually controlled,” as in the independent claims.

Accordingly, it is respectfully submitted that independent Claims 1 and 9, and claims depending therefrom, patentably define over Sanders.

Claims 3, 4, 11, and 12 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sanders in view of Gearty and Hennessy. Applicant also respectfully traverses that rejection.

Claims 3 and 4 depend on Claim 1, and Claims 11 and 12 depend on Claim 9, and Claims 1 and 9 are believed to patentably define over Sanders as discussed above. Further, it is respectfully submitted that Gearty and Hennessy also do not teach or suggest the features recited in the independent claims.

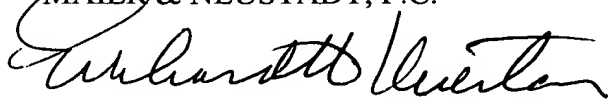
Gearty discloses two pipelines in Fig. 4 and shows that the signals sequentially shifting the output of the stage E3 are inputted to the respective stages as the control signals. Thus, the control signals are in sync with the output of stage E3. Hence, in Gearty, control timings of the respective stages may not be individually controlled. Therefore, Gearty also does not teach or suggest “a plurality of control signals provided corresponding to the respective stages, said control signals having timings capable of being individually controlled,” as in the independent claims.

Accordingly, it is respectfully submitted that independent Claims 1 and 9, and claims depending therefrom, are allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action that effect is respectfully requested.

Respectfully submitted,

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